

SECTION 15150 - METERS, GENERAL

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing general requirements for meters and flow measurement devices with associated instrumentation and controls designed for indicated functions including flow measurement, density determination, and batch metering of water, wastewater, chemicals, gases, and sludges.

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NTS: The WORK of this Section applies to the WORK of the following Sections.

1. Section 15151 In-Line Propeller Meters
2. Section 15152 Open-Flow Propeller Meters
3. Section 15156 Magnetic Flow Meters
4. Section 15157 Venturi Meters
5. Section 15158 Bypass Rotameters
6. Section 15159 Rotameters
7. Section 15160 Orifice Plates
8. Section 15161 Parshall Flumes
9. Section 15164 Ultrasonic Flow Meters (Field Mounted)
10. Section 15166 Diaphragm Gas Meters
11. Section 15167 Rotary Gas Meters
12. Section 15168 Turbine Gas Meters
13. Section 15172 Mass Flow Gas Meters
14. Section 15178 Ultrasonic Level Meters
15. Section 15180 Ultrasonic Density Meters

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1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 11000 Equipment General Provisions
2. Section 15000 Piping Components

1.3 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

1. ISA - S 5.1 Instrumentation Symbols and Identification
2. ANSI - B16.1 Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800

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| 3. ANSI/AWWA C207 | Steel Pipe Flanges for Waterworks Service - Sizes 4 In Through 144 In. |
| 4. ANSI/AWWA C701 | Cold-Water Meters - Turbine Type for Customer Service |
| 5. ANSI/AWWA C702 | Cold-Water Meters - Compound Type |
| 6. AWWA C704 | Cold-Water Meters - Propeller Type for Main Line Applications |
| 7. ASTM A 126 | Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings |
| 8. ASTM B 61 | Specification for Steam or Valve Bronze Castings |
| 9. ANSI/AWWA C110/A21.10 | Ductile-Iron and Gray-Iron Fittings, 3-In Through 48-In, for Water and Other Liquids |
| 10. ASME REPORT | Fluid Meters, Sixth Edition, 1971 |

1.4 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted in compliance with Section 01300:

1. Manufacturer's product data including catalogue cuts.
2. Shop drawings showing details and dimensions.
3. List of special tools.
4. Schedule of meter identifications and locations.

1.5 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL in compliance with Section 01300:

1. Certified performance data including curves showing flow and pressure drop.
2. Manufacturer's installation instructions.
3. Manufacturer's maintenance and operating instructions.
4. Manufacturer's certification that meters comply with published accuracies for the flow ranges indicated.
5. Certification that meters have been field-calibrated, under flow conditions.

1.6 INSPECTION, TESTING AND ACCURACY

A. **Inspection and Testing:** The manufacturer shall provide an experienced factory service representative to inspect and test meters for proper performance and installation and field calibrate meters under flow conditions.

B. **Accuracy:** Except as otherwise indicated, flow meters shall be designed and fabricated for an accuracy of plus or minus 2 percent of actual flow throughout the range indicated. Density measuring devices shall have an accuracy within plus or minus 2 percent of actual solids content over the range indicated.

1.7 SERVICES OF MANUFACTURER

- A. **Inspection, Startup, and Field Adjustment:** An authorized service representative of the manufacturer shall visit the site for not less than [2] days to furnish the indicated services.
- B. **Instruction of OWNER'S Personnel:** The authorized service representative shall also furnish the indicated services for instruction of the OWNER'S personnel in the operation and maintenance of the equipment including step-by-step troubleshooting procedures with necessary test equipment for not less than [one] day.

PART 2 -- PRODUCTS

2.1 SPECIAL TOOLS

- A. The WORK includes special tools recommended by the manufacturer and one extra steel spool for each size of meter. Spools shall be labelled and shall show meter identification, size and service.

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Meters shall be installed in accordance with the manufacturer's installation instructions.
- B. Meters shall be installed in easily accessible locations and oriented for ease of reading and maintenance, and, where shown, for balancing of flow. Wherever possible, meters shall be installed in such a way to comply with the manufacturer's recommendations. Meters, shut-off and balancing valves shall be properly supported. In-line meters shall be installed to ensure full-line flow and not less than the manufacturer's recommended head at all times.

3.2 TESTING

- A. Equipment shall be prepared for operational use in accordance with manufacturer's instructions after field calibration. The OWNER and the CONSTRUCTION MANAGER (at the option of either) reserve the right to observe field calibration.
- B. Meters shall be field tested at no less than 3 flow conditions over the total range of capability of the equipment. Where applicable, tests shall be conducted in accordance with the Test Code of the Standards of the Hydraulic Institute.

**** END OF SECTION ****